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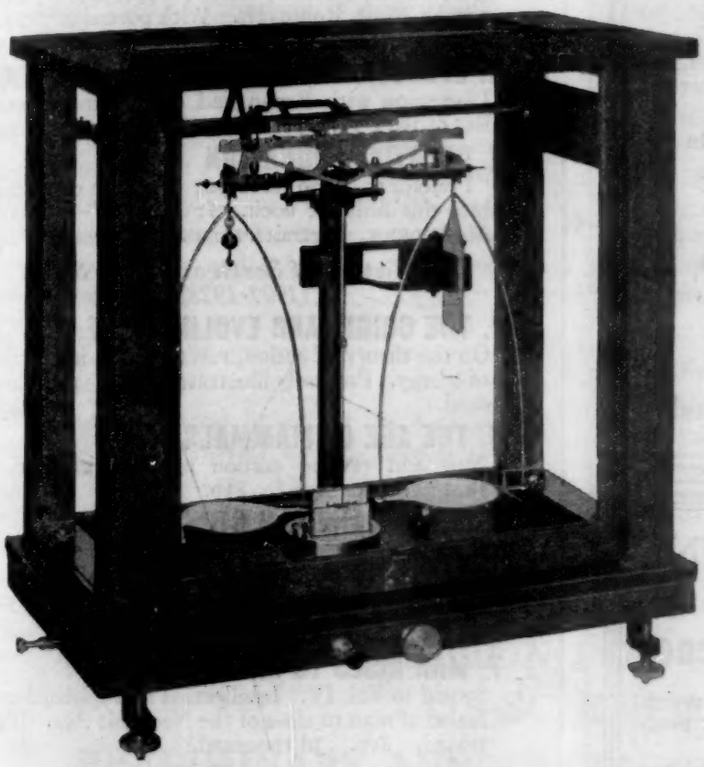

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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRELIMINARY ANNOUNCEMENT OF THE FIRST SYRACUSE MEETING

Edited by Dr. CHARLES F. ROOS

PERMANENT SECRETARY

SEVENTEEN scientific organizations and most of the fifteen sections of the American Association will hold scientific sessions in Syracuse during the period from June 20 to June 25. This meeting, which will be the first meeting of the association in Syracuse, is expected to be remembered for important symposia and for the opportunities offered for excursions and field trips for geologists, botanists, zoologists, chemists, statisticians, physicians and others who may attend.

Syracuse University, which will be the host institution, is cooperating with the local chamber of commerce and other local institutions to make this meeting a successful one. A short article giving some interesting information concerning the host institution and the Syracuse hotels appeared in SCIENCE for April 1.

LOCAL COMMITTEES FOR THE SYRACUSE MEETING

The following are the members of the local committees who are busy with plans for the summer meeting of the American Association for the Advancement of Science:

STEERING COMMITTEE

Honorary chairman, Chancellor Charles W. Flint, chancellor of Syracuse University.

General chairman, Dr. Hugh P. Baker, dean of the New York State College of Forestry.

Secretary, Dr. A. L. Elder.
Dr. W. L. Bray, dean of the Graduate School.
Dr. K. C. Leebrick, dean of the College of Liberal Arts.
Dr. L. C. Mitchell, dean of the College of Applied Science.
Dr. W. E. Mosher, director of the School of Citizenship and Public Affairs.
Dr. C. L. Raper, dean of the College of Business Administration.
Dr. H. G. Weiskotten, dean of the College of Medicine.
Dr. H. S. Ganders, dean of Teachers College.

STEERING COMMITTEE

The city of Syracuse is taking a very active interest in the arrangements for the guests of the university at the summer meeting. The following citizens of Syracuse are cooperating on the steering committee and assisting in making such plans as are necessary to unite together the efforts of the down-town district and the university:

Mr. W. L. Hinds, manufacturer.
Mr. Bert E. Salisbury, manufacturer and trustee of Syracuse University.
Mr. George H. Bond, lawyer and member of the New York State University Board of Regents.
Judge Frank H. Hiscock, former chief judge of the New York State Court of Appeals.
Mr. Horace White, former governor of New York State.
Mr. H. W. Smith, manufacturer.
Mr. Samuel H. Cook, manufacturer.
Mr. W. H. Kelley, banker, and Democratic State committeeman from Onondaga County.

CHAIRMAN OF SUBCOMMITTEES

Public Lectures: Dr. W. E. Mosher.
Meeting: Mr. Keith Kennedy.
Exhibits: Professor Ernest Reed.
Housing: Dr. Leslie Bryan.
Excursions: Professor S. P. Poole.
Publicity: Dr. Burgess Johnson.
Finance and Publication: Dr. D. Walter Morton.
Entertainment and Reception: Dr. H. L. Butler, dean of the College of Fine Arts.

LOCAL REPRESENTATIVES

Section A (*Mathematics*), Professor A. D. Campbell.
Section B (*Physics*), Professor R. A. Porter.
Section C (*Chemistry*), Professor R. S. Boehner.
Section D (*Astronomy*), Mr. R. W. Shaw, Physics Department, Cornell University.
Section E (*Geology and Geography*), Professor G. B. Cressey.
Section F (*Zoological Sciences*), Professor W. M. Smallwood.
Section G (*Botanical Sciences*), Professor H. F. A. Meier.
Section H (*Anthropology*), Professor D. G. Haring.
Section I (*Psychology*), Professor Ernst Thelin.
Section K (*Social and Economic Sciences*), Professor F. G. Crawford.
Section L (*Historical and Philological Sciences*), Professor R. V. Harlow.
Section M (*Engineering*), Professor E. F. Church.
Section N (*Medical Sciences*), Dr. M. S. Dooley.
Section O (*Agriculture*), Dean R. L. Nye, dean of the College of Agriculture.
Section Q (*Education*), Professor W. T. Melchior.

Any correspondence for the Local Committee pertaining to any of the sections should be addressed to the local representative. General correspondence for the Local Committee should be sent to Dean Baker or Dr. Elder.

Arrangements are being made through the Teachers College to furnish assistance for those who desire care of children. The Boy Scouts and the Girl Scouts are planning to assist in this work.

No doubt there will be many who will plan to drive to Syracuse, and excellent provisions are being made for those who are driving and camping. Camping facilities will be available at Kirk Park near the university campus. The site is a beautiful one for camping, and provisions for fuel, water, etc., will be made. Guards will be provided around the camp at all times during convention week.

Mr. Howard Viets has charge of outdoor recreation and has made arrangements with various golf courses for the convention week. Those who desire to play tennis, go swimming, or fishing, will find that by convention time Mr. Viets will have a list of all places available for such recreation. Greatly reduced rates at the golf courses have been obtained.

Most of the scientific sessions will be held at Syracuse University. The general program of the meeting will be available on Monday morning, June 20, at 9:00 A. M. and throughout the week at the association's registration office in the Men's Gymnasium. This book will be supplied free to all members of the association who register and may be purchased by others. Any person who does not attend the meeting may have a free copy of the program sent by mail if a request is addressed to the permanent secretary's office, Smithsonian Institution Building, Washington, D. C.

GENERAL SESSIONS

The Syracuse meeting will be held under the presidency of Dr. John Jacob Abel, of the Johns Hopkins University, who is widely known for his valuable contributions to pharmacology and chemistry. The retiring president this year is Dr. Franz Boas, of Columbia University. Dr. Boas is frequently called the dean of American anthropologists.

General lectures will be given by eminent scientists, one on each of the five nights of the meeting period, and one or more on each afternoon. Professor Edward L. Thorndike, of Columbia University, will de-

liver a general lecture on the subject "The Psychology of Capital." On Tuesday evening, Dr. J. O. Perrine, of the Bell Telephone Laboratories, will lecture on "Television." On Wednesday evening, Dr. W. F. G. Swann, of the Bartol Research Foundation, will give an illustrated lecture on "Cosmic Rays." Dr. Swann plans to perform one or more experiments on cosmic rays during his lecture. A general lecture which is planned to be on some phase of public health will be particularly appropriate at Syracuse, since June 20 will be the one hundredth anniversary of the founding of the Syracuse Department of Public Health. At an evening session, Professor Henry Crew, of Northwestern University, will give a general address on "The Relation of Science to International Expositions." In particular Dr. Crew will talk about some of the features of the Century of Progress Exposition at Chicago in 1933 which will appeal particularly to scientists. Other general addresses will be given as follows: "Refuse Ideas and Their Disposal," by Professor Dixon R. Fox, of Columbia University; "A Layman's Introduction to Higher Mathematics," by Professor Walter B. Carver, of Cornell University; "The Toxicity of Inorganic Substances," by Professor Rodney H. True, of the University of Pennsylvania, and "Some Traits of Society in the South Sea Islands," by Professor Richard Thurnwald of Yale University. It is expected that two or three more popular addresses will be added to the general program of the association.

The Syracuse reception will be held on Monday evening following the opening lecture. All members of the association who register will be furnished free tickets to the reception for themselves and for members of their immediate family who register. Nonmembers of the association may attend the reception by joining at Syracuse on payment of the entrance fee and dues for one half year, or by becoming associates for the meeting. The associate fee for the Syracuse meeting is $2.50.

FIELD EXCURSIONS

AT the June meetings of the Association for the Advancement of Science, advantage is to be taken of the summer weather to visit as many parts of the state as possible. Section E is especially planning for its members to do a large part of their work in the field.

The rich variety of topographic and physiographical forms that Central New York affords will be looked over as thoroughly as possible. On Wednesday, June 22, the afternoon will be devoted to a field trip through the great drumlin belt near the Finger Lakes and to the Jamesville plunge basins. Stops will be made also in the Tully Moraine, certain of the numerous cross channels and some of the water falls and places of glacial or topographic interest in the lake region.

Several trips will be conducted on Thursday afternoon, after a morning devoted to papers on Paleozoic stratigraphy. These will be to many of the classic exposures of the Silurian and Devonian for which Central New York is so well known. On these trips opportunity will be afforded for those who desire to make such collections as they wish.

The final day, Friday the 24th, will be devoted to an all-day excursion through the Mohawk valley and into the older rocks of the Adirondack region. This will interest the geographer as well as the geologist, for it will give a broad view of land utilization and the adaptation of trade routes to topography in the famous Mohawk Corridor.

Sections F and G (Zoology and Botany) are also planning an extensive and interesting program of field excursions. One of these will be to the Green Lakes at Jamesville and another to the wild life preserve near McLean. A third all-day trip is to afford opportunity to visit the bogs and marl ponds at Junius, southwest of Syracuse.

On all these trips, lunches and suppers will be provided where necessary in the field, and the entire cost of all of them will be held strictly to a minimum. All who attend the meetings of the association or associated societies are invited to take advantage of these excursions. It is desired by all the local representatives of the sections as well as the chairman of the committee on excursions that those who attend the meetings and contemplate participating in any of these excursions inform the local committee, at least not later than at the time of registering.

NOTICES FOR THOSE PLANNING TO ATTEND

Those who plan to attend this meeting should engage hotel rooms at once, addressing the hotels. Whether the room desired is to be occupied by one or two persons should be stated, also the approximate price which the applicant wishes to pay and the date on which the room is to be occupied. Approved hotels are the following: Hotel Syracuse (general headquarters), Onondaga Hotel, Yates Hotel, Jefferson-Clinton Hotel, Mispah Inn, Hotel Hilton, Hotel Wood, Truax Hotel and Kirk Hotel. An article containing more complete hotel information appeared in SCIENCE for April 1, 1932.

When purchasing your railway ticket to Syracuse, be sure to secure a certificate for the Syracuse meeting of the American Association for the Advancement of Science and bring the certificate with you to the registration offices for the meeting.

REDUCED RAILWAY RATES

Reduced railway rates for the Syracuse meeting, by the standard certificate plan, have been granted by all the railway passenger associations in the United States and Canada, but a few companies, listed below, have not granted reduced rates. The round-trip fare by this plan is one and one half times the regular one-way fare.

Tickets to Syracuse by the standard certificate plan are to be purchased within time limits as follows: June 16 to 22, inclusive, for Canadian Eastern lines, Central lines, New England lines, Southeastern lines and Trunk lines. For Western and Transcontinental lines the inclusive dates are June 13 to 19 from California; June 14 to 20 from Arizona, British Columbia, Idaho, Montana, Nevada, Utah, Washington and Oregon (except via California); June 13 to 19 from Oregon (via California); June 15 to 21 from New Mexico, Wyoming and Colorado (except Julesburg); June 16 to 22 from Julesburg, Colorado, and from Illinois, Iowa, Kansas, Manitoba, Minnesota, Missouri, Nebraska, northern Michigan, North Dakota, South Dakota and Wisconsin. For the Southeastern lines the inclusive dates are June 15 to 21 from Oklahoma and Texas and June 16 to 22 from Arkansas, Kansas, Louisiana and Missouri; also Memphis, Tennessee, and Natchez, Mississippi. For the Canadian Western lines the inclusive dates are June 14 to 20 from British Columbia; June 15 to 21 from Alberta; June 16 to 22 from Saskatchewan, Manitoba, and Ontario.

The following Southwestern lines do not offer reduced fares on the certificate plan: Arkansas and Louisiana Missouri Railway, Fort Smith and Western Railroad, Graysonia, Nashville and Ashdown Railroad, Louisiana, Arkansas and Texas Railway, Oklahoma City-Ada-Atoka Railway, Wichita Falls and Southern Railway, Kansas, Oklahoma and Gulf Railway, National Railways of Mexico and the Midland Valley Railway.

Persons residing in the regions of reduced rates (almost all the United States and Canada) should each purchase a first-class, full-fare, one-way, through ticket to Syracuse, being sure to secure a certificate on "Standard Certificate Form," reading for the "Syracuse meeting of the American Association for the Advancement of Science and Associated Societies." A receipt is not required and will not be used.

Persons residing outside the regions of reduced rates should each purchase a round-trip ticket to the nearest station issuing through tickets to Syracuse and situated within the region of reduced rates. On arrival at that station a one-way ticket to Syracuse and a certificate, as directed in the preceding paragraph, should be secured.

Every one should register immediately upon arrival at Syracuse, at the registration offices for the meeting, in the Men's Gymnasium, Syracuse University. Be sure to fill in all blanks on the registration card and leave the card at the registration desk, where you will receive a numbered identification card, which will be receipted for the registration fee paid. (See Registration, below.) Then leave your railway certificate at the validation desk, being sure that the identification card (which you keep) is there marked to show that you have deposited a certificate. Your certificate will subsequently be endorsed by the association and then validated by the agent of the transportation companies. Call for it later at the validation desk, where you left it, presenting your identification card.

Unvalidated certificates will not be honored for the purchase of return tickets and unendorsed certificates can not be validated. Registration is therefore necessary in order to have a railway certificate validated. Each person registering is entitled to the validation of his own certificate.

For the return trip, railway agents at Syracuse will honor any properly endorsed and validated certificate if presented at least thirty minutes before the scheduled time of departure of the train for which it is to be used. Each person presenting an endorsed and validated certificate may purchase a continuous-passage, one-way, return ticket for one half of the regular fare, by the same route as that followed on the trip to Syracuse. Certificates may be validated from June 21 to 23. The last date on which return tickets may be purchased is June 29.

Attention is called to summer-tourist fares which will be in effect at the time of the Syracuse meeting. Short-limit summer tickets are limited to 30 days, including date of sale, and are somewhat less in price than season-limit tickets which are good for the return trip until October 31. It is advisable to obtain further information from the railroad ticket agent about these special fares.

THE AMERICAN ASSOCIATION PRESS SERVICE

By Austin H. Clark

The prestige of any organization depends upon how widely and how favorably it is known to the public at large. The general public gets its information regarding such organizations as the association entirely from the daily press.

It is therefore incumbent upon the members of the association to see that the representatives of the press are provided at each meeting with the material necessary for the preparation of accurate and adequate accounts of the proceedings.

Those who are on the program of the Syracuse

meeting are requested to send as soon as possible to Austin H. Clark, Director of the Press Service, A. A. A. S., Smithsonian Building, Washington, D. C., *two* copies of their complete papers, and also *two* copies of an abstract of about 500 words in length.

Abstracts alone are, generally speaking, of relatively little value. They serve to call attention to the points in the paper which are new, or which in the opinion of the author are of special interest.

But very often the points of greatest popular interest in a paper are not those that would be mentioned in an abstract prepared by the author. Many facts entirely commonplace to one specializing in science are entirely new and most interesting to the public at large.

Another thing is that abstracts are so short that when used for press purposes they must often be run almost word for word. This means that little latitude is permitted the representatives of the various press services and individual papers in preparing their stories, which are therefore of necessity very much alike.

With the complete copies of the papers before them, the press representatives can write accounts of the addresses that will be far more satisfactory to all concerned.

Promptness in sending in copies of the papers to the Press Service is most desirable. If the copies of the papers are available well in advance of the meeting the representatives of the press can go over them in their spare time. They are thus enabled to study them carefully and, as a result, to write from them much better stories than if their work had to be done under pressure in a limited time.

In many cases papers that would be quite useless for news purposes if received at the last minute are found to be of considerable interest if they are available a sufficient length of time in advance to permit of careful study.

Copies of papers sent to the Press Service are for press use only. They are regarded as confidential and are not seen except by the Press Service and the press representatives.

After the meeting they are retained and are thoroughly examined for possible feature or other articles, or for the preparation from them of short items of popular interest.

It is not practicable to return to the authors material sent to the Press Service. It is assumed that papers sent in for press use are extra copies that can be spared.

The Press Service is concerned only with the relations between the association and the press. The titles of papers and all other information concerning them should be sent to the permanent secretary. Only material having to do directly with publicity should be sent to the Press Service.

SCIENTIFIC SESSIONS OF SECTIONS AND SOCIETIES

Note.—Names of organizations are arranged in the order of association sections. Each affiliated society has one or two representatives in the association council as indicated by one or two asterisks before the society name. A cross before a name indicates that the society is associated but not affiliated. Societies which have neither asterisks nor crosses before their names are not associated but have been especially invited to meet with the association on this occasion. The vice-president, retiring vice-president and secretary are named for each association section, the president and secretary are named for each society and the council representatives for the affiliated societies. Dates of meetings when supplied are to be read as inclusive. For more complete information the General Program of the meeting should be consulted. This will be available at the registration desk on Monday morning, June 20.

A. Mathematics.

A–1——Section A of the Association. June 22–23.
Vice-president, Howard H. Mitchell; *retiring vice-president*, Earle Raymond Hedrick; *secretary*, Charles N. Moore.

Sessions for the reading of several one-hour addresses are planned for Tuesday and possibly Wednesday of the meeting week. Professor W. A. Hurwitz, of Cornell University; Professor H. M. Gehman, of the University of Buffalo, and Professor J. A. Shohat are expected to give addresses on work in which they are particularly interested at this time. Professor W. B. Carver, of Cornell University, will deliver a general address before the association on "A Layman's Introduction to Higher Mathematics." Professor Earl R. Hedrick, of the University of California at Los Angeles, will participate in a symposium on "General Educational Problems" with Professor E. L. Thorndike, Professor J. G. Needham and other men of eminence. Members of Section A and other mathematicians are specially invited to attend the meetings of Section K (Economics, sociology and statistics) and of the Econometric Society. (See the announcement of Section K.)

B. Physics.

B–1——Section B of the Association. June 22.
Vice-president, D. L. Webster; *retiring vice-president*, Bergen Davis; *secretary*, A. L. Hughes.

On Wednesday evening, June 22, Dr. W. F. G.

Swann, president of the American Physical Society, will deliver a general illustrated lecture on "Cosmic Rays." (See General Sessions.) On Friday evening, Professor Henry Crew, of Northwestern University, will speak on "The Relation of Science to International Expositions." Since the affiliated American Physical Society is meeting in New Haven during the same period as the association's meeting, no technical sessions are planned by Section B, but physicists are invited to attend the symposium on the "Effect of X-rays on Biological Life." (See Section C.)

C. Chemistry.

C–1——Section C of the Association.
Vice-president, F. C. Whitmore; *retiring vice-president,* C. A. Browne; *secretary,* R. C. Funson.

C–2—**American Chemical Society (Regional Meeting of New York Sections).
Chairman, C. C. Spencer; *secretary,* N. E. Artz.

The New York Sections of the American Chemical Society will hold their annual regional meeting jointly with Section C at Syracuse, probably on Friday and Saturday. More than thirty papers have already been placed on the program. A joint session with the biologists and the physicists, for a symposium on "The Effect of X-Rays on Biological Life," is planned for Friday morning. In addition to these programs it is planned to have one or more general lectures on chemistry.

D. Astronomy.

D–1——Section D of the Association.
Vice-president, P. W. Merrill; *retiring vice-president,* J. H. Moore; *secretary,* Philip Fox.

During the meeting period astronomers are expected to be very busy preparing for the eclipse which will occur on August 31. As a result it seems inadvisable for Section D to arrange a program.

E. Geology and Geography.

E–1——Section E of the Association. June 21–24.
Vice-president, W. H. Hobbs; *retiring vice-president,* D. W. Johnson; *secretary,* K. F. Mather.

On Tuesday afternoon, June 21, Section E plans a joint session with Section M (Engineering) for a symposium on "Aerial Photographic Surveying and Mapping" (see Section M). On Tuesday, Section E will join Section O for a symposium on "Land Use." On the morning of June 23 a session will be held devoted to "The Paleozoic Stratigraphy of New York." In the afternoon there will be an excursion to points of special stratigraphic interest. On Wednesday morning, June 22, a symposium will be held on "Local Physiography, Including Glacial Problems." A field trip to be devoted to a study of physiography is also planned for Thursday. An all-day field trip is planned for Friday, June 24, to the Mohawk Valley and possibly to the Adirondacks.

F. Zoology.

F–1——Section F of the Association.
Vice-president, Charles Zeleny; *retiring vice-president,* R. W. Hegner; *secretary,* G. [illegible] Hargitt.

F–2—**Ecological Society of America.
President, G. E. Nichols; *secretary,* Raymond Kienholz; *council representatives,* W. C. Allee and G. P. Burns.

A session devoted to a symposium on "The Effect of X-Rays on Biological Life" is planned for Friday, June 24. Members of Section F are invited to send titles of papers which they are to present to the secretary of the section. Several half-day excursions to Junius, Jamesville and Selkirk are planned for June 21, 22 and 23. On these occasions a number of informal talks on local fauna will be given.

The Ecological Society of America plans meetings for the reading of papers and a number of field trips.

G. Botany.

G–1——Section G of the Association.
Vice-president, H. L. Shantz; *retiring vice-president,* E. D. Merrill; *secretary,* S. [illegible] Trelease.

G–2—**Botanical Society of America.
President, G. J. Peirce; *secretary,* S. [illegible] Trelease; *council representative,* I. [illegible] Lewis.

G–3—**Torrey Botanical Club.
President, E. W. Sinnott; *secretary,* F. [illegible] McLean; *council representatives,* D. [illegible] MacDougal and B. O. Dodge.

G–4——†American Fern Society.
President, W. R. Maxon; *secretary,* C. [illegible] Lewis.

G–5——Syracuse Botanical Club.

As customary, the programs for Section G will be arranged by the associated societies. Half-day field trips are planned for June 21 and 22 and an all-day field trip for June 23.

The Botanical Society of America will hold a meeting along the lines usually followed in its summer meetings. There will be no program for the reading of papers. Meetings will be largely field trips with a few demonstrations and perhaps round tables.

The American Fern Society plans a number of field trips.

H. Anthropology.

H–1——Section H of the Association.
Vice-president, C. H. Danforth; *retiring vice-president,* W. K. Gregory; *secretary,* C. E. Guthe.

A symposium on "Far Eastern Problems" is planned with Professor E. S. C. Handy and Professor Richard Thurnwald taking part.

I. Psychology.

I-1——Section I of the Association.
Vice-president, W. S. Hunter; *retiring vice-president*, H. S. Langfeld; *secretary*, J. E. Anderson.

I-2——Upper New York Psychologists.

The Upper New York Psychologists plan a two-day meeting in cooperation with Section I of the Association. In addition several symposia are being organized. A joint session with Section K on Tuesday afternoon will be devoted to a symposium on "Social Statistics." Professor L. L. Thurstone will speak at this session. Other symposia are planned on "Mental Hygiene" and "Industrial Psychology."

Professor E. L. Thorndike, of Columbia University, will deliver an address at a general evening session of the association on "The Psychology of Capital." Sessions of interest to some psychologists will be held by Section K, in connection with symposia on "Demand and Supply."

K. Economics, Sociology and Statistics.

K-1——Section of the Association.
Vice-president, W. F. Ogburn; *retiring vice-president*, G. C. Evans; *secretary*, Harold Hotelling.

K-2——*The Econometric Society.
President, Irving Fisher; *secretary*, C. F. Roos; *council representative*, W. A. Shewhart.

On Thursday afternoon Section K will meet jointly with the Econometric Society, for a symposium on "Money and Capital," at which Professor Irving Fisher will preside. Dr. Carl Snyder, economist of the Federal Reserve Board; Professor T. N. Carver, of Harvard University, and others will take part in this symposium. In this connection it should be noted that Professor Edward L. Thorndike, of Columbia University, will deliver a general address at an evening session of the association on the subject "The Psychology of Capital."

Tuesday morning Section K will join with the Econometric Society for a symposium on "Demand and Supply." Papers of mathematical interest will be given at this session. On Tuesday afternoon Section K will hold a joint session with Section I for a symposium on "Social Statistics," at which time Professor L. L. Thurstone, of the University of Chicago, will deliver an address.

On Wednesday morning Section K and the Econometric Society will hold a session for papers on mathematical statistics. This session will be followed by a report on collegiate mathematics needed in the social sciences. On Wednesday afternoon sessions for additional papers on "Demand and Supply" will be held at Cornell University. An inspection of the statistical laboratory of Professors Warren and Pearson will follow.

L. Historical and Philological Sciences.

L-1——Section L of the Association.
Vice-president, W. G. Leland; *retiring vice-president*, W. B. Munro; *secretary, Committee on History of Science*, Joseph Mayer; *secretary, Committee on Linguistics*, Leonard Bloomfield.

L-2——New York Historical Association.
President, D. R. Fox; A. C. Flick, *corresponding secretary.*

Sessions of the New York Historical Association are being organized by Professor Dixon R. Fox, of Columbia University, for Tuesday. It is hoped that in addition to these programs a session devoted to the "History of Medical Science in its Relation to Public Health" can be organized to commemorate the one hundredth anniversary of the founding of the Syracuse Department of Public Health.

Following the Tuesday afternoon session, Professor Dixon R. Fox will deliver a general address before the association on the subject "Refuse Ideas and Their Disposal."

M. Engineering.

M-1——Section M of the Association.
Vice-president, D. C. Jackson; *retiring vice-president*, D. S. Kimball; *secretary*, N. H. Heck.

On Tuesday morning Section M will hold a session for a symposium devoted to "Industrial Engineering." At this session Dr. D. A. Laird, Dr. Allan Mogenson, Dr. Myron Lee and others will give addresses. On Tuesday afternoon Section M will meet jointly with Section E (Geology and Geography) for a session devoted to "Aerial Photographic Surveying and Mapping." Dr. H. L. Cooke, of Princeton University, will take part in this symposium.

On Tuesday evening, Dr. J. O. Perrine, of the American Telephone and Telegraph Company, will deliver a general address on "Television."

Several excursions and industrial trips are planned for members of Section M attending the meetings.

N. Medical Sciences.

N-1——Section N of the Association.
Vice-president, W. H. Park; *retiring vice-president*, H. T. Karsner; *secretary*, W. W. Cort.

N-2——**American Society of Bacteriologists (Central New York Branch).

N-3——**Society for Experimental Biology and Medicine (Western New York Branch).

N–4—**American Roentgen Ray Society.
President, Leopold Jaches; *secretary,* E. P. Pendergrass; *council representative,* Donald Childs.
N–5——Onondaga County Medical Society.
N–6——Syracuse Academy of Medicine.

The program of Section N and its associated and invited societies promises to be much better than usual. Sessions will begin on Tuesday afternoon with a program arranged by Section N and will continue through Friday morning.

Sessions of the American Society of Bacteriologists are planned for Thursday morning and afternoon and Friday morning.

The program of the Society for Experimental Biology and Medicine will consist of sessions devoted to miscellaneous contributed papers and to other sessions for the reading of papers by invited speakers.

It is planned also to have an authority on public health deliver one of the general evening lectures and to devote a session to the history of medical science in its relation to public health. These sessions are planned to commemorate the 100th anniversary of the founding of the Syracuse Department of Public Health. A cholera epidemic was directly responsible for the founding of this institution.

O. Agriculture.
O–1——Section O of the Association.
Vice-president, J. H. Gourley; *retiring vice-president,* C. G. Williams; *secretary,* P. E. Brown.
O–2—**American Society of Agronomy (Northeastern Section).
Secretary, M. H. Cubbon.

Section O plans meetings on Tuesday devoted to symposia on "Land Use." It is proposed to consider the task of putting the different classes of land to their proper uses, to focus attention to the idle land situation and to develop a better understanding of the whole subject of land in its relation to human affairs. Special reports will be presented on the results of Land Economic Surveys that have been in progress in several states during the past decade. Among the speakers will be Dr. Jacob G. Lipman, Dr. G. F. Warren, Dr. Henry G. Knight, Dr. Charles L. Roper, Dr. E. P. Weaver, Dr. Joseph S. Illick, Mr. Franklin D. Roosevelt, and Mr. L. R. Schoenmann. The session on Tuesday morning will be held jointly with Section E (Geology and Geography). The American Society of Agronomy will hold meetings in Geneva on Wednesday and in Ithaca on Thursday. Dr. U. P. Hedrick will deliver an address at Geneva on Wednesday morning on the subject, "Fifty Years of Research at Geneva." Following a tour of the laboratories, papers will be given by H. J. Conn, R. W. Hofer, H. B. Tukey, M. T. Munn, C. B. Sayre, J. G. Horsfall and Richard Wellington. At Ithaca addresses will be given by Cornelius Betten, T. L. Lyon, J. A. Bizzell, R. A. Emerson and R. G. Wiggans. Following an inspection of the field experiments of the departments of agronomy and plant breeding at Cornell a picnic supper will be held at Enfield Glen.

Q. Education.
Q–1——Section Q of the Association.
Vice-president, S. A. Courtis; *retiring vice-president,* Ernest Horn; *secretary,* W. L. Uhl.

Section Q plans to hold a number of sessions devoted to discussions of general education problems by men of national prominence. Dr. Edward L. Thorndike, Dr. J. G. Needham, Dr. E. R. Hedrick and others have indicated that they will participate in these discussions. Dr. Thorndike will deliver a general evening lecture using the title "The Psychology of Capital."

OBITUARY

JOHN WESLEY YOUNG

FROM time to time we are called upon to take an inventory, and to adjust ourselves as best we can to new and unexpected circumstances.

Such a necessity arose when, on February 17, 1932, the notice was flashed across the country that John Wesley Young was dead.

He was born at Columbus, Ohio, November 17, 1879, but spent much of his childhood and early youth, 1889–1895, at Baden Baden where his father was American consul. His mother, of French and German ancestry, was born in Paris. Probably these facts account for the linguistic skill and felicity of the son. He graduated from Ohio State University in 1899, and then went to Cornell University where he completed his work for the doctorate in 1903, but on account of illness did not take his examination until 1904. While at Cornell he was not only an excellent student, but participated eagerly in various activities, especially in the newly founded graduate club, and had a wide circle of friends, from various walks of life. He was assistant at Cornell, 1902–1903; instructor at Northwestern, 1903–1905; preceptor at Princeton, 1905–1908; University of Illinois, 1908–1910, and was made head professor at the University of Kansas, 1910. The following year he was called

to Dartmouth College, where he continued throughout his life.

The main feature of Young's activity was the breadth of his interest. He was receptive and sympathetic to any appeal that was genuine and sincere, had no respect for pomp and display, and was helpful and cooperative in every honest endeavor.

The main contributions may be divided into three general categories, (a) research, (b) teaching, (c) organization. (a) His first interest was in groups, but rapidly widened to include geometry and particularly foundations of mathematics. The most important are (1) his thesis on automorphis functions, (2) General theory of approximations by functions involving a given number of arbitrary parameters, the (3) Fundamental concepts of algebra and geometry (Macmillan, 1911), and the monumental work on Projective Geometry (Ginn and Company, 1910) with Professor Veblen, besides a number of other important articles in various mathematical periodicals. (b) In the teaching of mathematics he was always intensely interested and active; besides his uninterrupted support of the Mathematical Association of America as member of the council, vice-president and president, he was chairman of the National Committee on Mathematical Requirements. This work took much of his time and energy for eight years and resulted in the appearance of a volume of 650 pages which will exercise a profound influence on the teaching of elementary mathematics for many years. In this connection he also exercised a helpful influence as editor of mathematical texts for two important publishers. He also served as chief examiner in mathematics for the College Entrance Examination Board for two years, and cooperated in several far reaching innovations. (c) During the last few years the financial status of the Association and of the American Mathematical Society has demanded a great deal of careful study. Professor Young was appointed chairman of the Committee on Funds for both organizations and had already brought considerable order and system into the situation and had plans for future development that promised definite relief.

An active and fruitful service of over a quarter of a century has closed, and a cherished personality has become a memory. May those who are still active receive sufficient inspiration from his efforts to continue with the same endeavor.

VIRGIL SNYDER

RECENT DEATHS

GEORGE SYLVANUS MOLER, professor emeritus of physics at Cornell University and co-builder of the first commercial dynamo operated in the Western Hemisphere, died on May 20. He was eighty-one years old and had retired from active service in 1917.

DR. THOMAS H. GRONWALL, associate in physics at Columbia University, author of many papers on mathematics and the applications of mathematics in engineering and physics, died on May 9, in his fifty-fifth year.

BRIGADIER GENERAL WILLIAM BARCLAY PARSONS died on May 10, at the age of seventy-three years. Dr. Parsons was a member of the engineering staff in charge of the construction of the Panama Canal and was the builder of the Cape Cod Canal. He had been chairman of the board of trustees of Columbia University since 1917. He was also a trustee of the New York Public Library and of the Carnegie Institution of Washington.

DR. CHARLES W. RICHMOND, associate curator of birds at the National Museum, died on May 17, at the age of sixty-three years.

HARRY H. BARROWS, assistant chief of the Bureau of Agricultural Engineering of the U. S. Department of Agriculture, died suddenly on May 3.

DR. R. BISHOP CANFIELD, since 1904 chief otolaryngologist of the University of Michigan Hospital and authority on the surgery of the ear, nose and throat, has been fatally injured in an automobile accident.

DR. JOHN R. MINEHART, dean of the School of Pharmacy of Temple University, Philadelphia, died on May 10, at the age of forty-four years.

THE death is announced at the age of forty-four years of John Berdan Charlesworth, research associate in African ethnology at the Peabody Museum of Harvard University. Mr. Charlesworth held the Anthony Wilkins Memorial Studentship of the University of Cambridge. Under his fellowship, and jointly for the Peabdy Museum, Mr. Charlesworth had completed a two years' intensive study among the Basukuma, a Bantu tribe in Tanganyika Territory, Africa, south of Lake Victoria. It was on the return journey from this research that he died at sea of black-water fever. His collections and notes will go to the Peabody Museum.

THE death is announced of Sir W. Watson Cheyne, past-president of the Royal College of Surgeons of England, and consulting surgeon to King's College Hospital.

THE death is announced at the age of seventy-nine years of Charles Debierre, professor of anatomy at the Lille Medical School.

SCIENTIFIC EVENTS

PRIMITIVE AREAS IN THE WASHAKIE NATIONAL FOREST IN WYOMING

THE Forest Service announces the formal approval and designation of two primitive areas within the Washakie National Forest in Wyoming. These will be known as the Glacier and the Stratified Primitive Areas, and contain 108,500 and 147,000 acres, respectively. The latter-named tract is situated in the extreme northern part of the forest, in a country characterized by broad flat-topped plateaus, cut away in places by deep, narrow canyons.

The Glacier Primitive Area lies on the east slope of the Continental Divide, or Wind River Range, near the central part of the Washakie Forest, and adjoins on the east the Bridger Primitive Area, containing 138,000 acres of land on the western slope of the Continental Divide. The two combined contain nearly 250,000 acres of rugged, mountainous land that can scarcely be surpassed for scenic grandeur and beauty.

Glacier Primitive Area is within an extremely rough and rugged region, containing innumerable Alpine lakes and some of the largest living glaciers within continental United States. It is the home of the largest herd of mountain sheep left in Wyoming. Its mountains include Fremont and Gannett Peaks—the two highest in the state. The canyons are extremely deep and precipitous.

The Stratified Primitive Area has been built up of eruptive rock from the Mt. Washburn volcanic area, in the Yellowstone Park, and Lava Mountain, at the head of Wind River. This eruptive material has been laid down in horizontal strata which are unstable and break down irregularly, often resulting in step-like precipitous cliffs and buttes, separated by many narrow valleys.

The abundance and tameness of wild life lends charm to the surroundings. This is the chief summer range of the Wind River elk herd of about 1,500 head. Deer are also plentiful. Mountain sheep and moose are often seen. The unit is also rich in the petrified remains of forests of earlier geologic times. Sections of petrified trees may be found in streams and standing petrified tree trunks may be seen elsewhere.

The designation of these lands as primitive areas means that they will be retained virtually in their natural state, and no motor roads, summer homes, resorts or other forms of settlement will be permitted within their boundaries. These areas are admirably adapted for the purpose for which they have been selected and will afford opportunities for present and future generations to visit and enjoy a wonderfully scenic region unchanged by modern civilization.

THE ANNUAL REVIEW OF BIOCHEMISTRY

THE first volume of the *Annual Review of Biochemistry*, published on May 3, is the introductory number of a new publication in the field of biochemistry. It is the purpose of the *Review* to present for the use of biochemists, physiologists, agricultural, organic and medical chemists, and scientists in related fields, annual and biennial surveys of the literature in biochemistry. Thirty to thirty-five subjects of major interest will be reviewed. The work is of international authorship, contributors having been selected from this country, Canada, Great Britain and continental Europe. The names follow: R. J. Anderson, M. L. Anson and A. E. Mirsky, W. R. Bloor, J. L. Bollman and F. C. Mann, L. R. Cerecedo, J. B. Collip and D. L. Thomson, Hans Fischer and F. W. Neumann, R. A. Gortner, L. J. Harris, M. Heidelberger, D. R. Hoagland, R. Hober, E. G. Holmes, N. N. Ivanov, P. Karrer and A. Helfenstein, H. D. Kay, P. A. Levene and A. L. Raymond, H. B. Lewis, J. M. Luck, Joseph Needham, J. Parnas, R. Robinson, W. C. Rose, L. Ruzicka, C. L. A. Schmidt, P. A. Shaffer and E. Ronzoni, C. P. Sherwin, A. T. Shohl, I. Smedley-MacLean, Arthur H. Smith, H. A. Spoehr, M. Stephenson, H. B. Vickery, E. Waldschmidt-Leitz, A. Windaus and R. Wurmser.

The *Review* is being published under the direction of an Advisory Committee consisting of C. L. Alsberg, D. R. Hoagland, J. Murray Luck (Chairman and editor) and C. L. A. Schmidt, and with the financial support of the Chemical Foundation.

The first volume covers the literature of 1930 and 1931 with the exception of several reviews which pertain strictly to material published in 1931. It is of 730 pages and contains approximately 3,850 bibliographic references. The volume is published by Stanford University Press.

THE SIGMA XI CHAPTER OF THE UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE

THE annual meeting of the Sigma Xi Chapter of the College of Medicine, University of Illinois, was held on May 12. Fifteen members and twenty-two associate members were elected.

Dr. F. R. Moulton, past president of the National Society, was present and addressed the meeting. Dr. L. B. Wilson, national president, also gave an address. The Northwestern Chapter was represented by Dr. L. B. Arey, professor of anatomy, and president of the chapter. Professor E. S. Bastin represented the University of Chicago Chapter.

The scientific program was:

"New Studies on the Thyroid Gland," Dr. G. Zechel.

"The Histogenesis of the Valvular Lesions in Endocarditis Lenta (Subacute Bacterial Endocarditis), Dr. R. H. Jaffe.

Each year the Sigma Xi presents a prize to the student doing the most important research during the year. This competition is confined to undergraduates. The prize this year was awarded to Edgar A. Thacker—subject: "For a Study of the Physiological Action of Irradiated Ergosterol."

The University of Illinois College of Medicine is the only independent chapter connected with a medical college. There is, however, a similar organization at the Mayo Institute. The University of Illinois and the University of Minnesota are the only universities each having two distinct chapters.

The officers elected for the coming year are:

Charles S. Williamson, *President.*
W. J. R. Camp, *Vice-president.*
Isadore Pilot, *Treasurer.*
William H. Welker, *Secretary.*

NATIONAL RESEARCH FELLOWSHIPS IN THE BIOLOGICAL SCIENCES

THE second and final meeting of the Board of National Research Fellowships in the Biological Sciences for the award of 1932–33 appointments was held in Washington on April 28 and 29. In addition to the eleven reappointments and twelve new appointments voted at the February meeting, nineteen further reappointments and twenty-four first appointments were made at the current meeting, as follows:

REAPPOINTMENTS

For domestic study—Bachus, Myron P., agriculture; Bayroff, Abram G., psychology; Carpenter, C. Ray, psychology; Clarke, Alfred E., agriculture; Claus, Walter D., zoology; Craig, Lyman C., zoology; Dexter, Stephen T., agriculture; Garvey, Chester R., psychology; Hollaender, Alexander, botany; Lammerts, Walter E., botany; Leonard, Samuel L., zoology; McClintock, Barbara, botany; Nelson, Warren O., zoology; Saeger, Albert C., botany; Snell, George D., zoology; Stone, Raymond G., zoology; Zscheile, F. P., Jr., botany.

For study abroad—Graubard, Marc A., zoology; Valentine, J. Manson, zoology.

NEW APPOINTMENTS

For domestic study—Bond, R. M., zoology; Boughton, D. C., agriculture; Burkholder, P. R., botany; Casida, L. E., agriculture; Drayton, F. L., botany; Fry, G. A., psychology; Glass, H. B., zoology; Horton, G. P., psychology; Jackson, Theodore A., psychology; Kaufmann, B. P., botany; Kerr, Thomas, botany; Miller, E. S., botany; Morsh, J. E., psychology; Phelps, Austin, zoology; Riley, H. P., botany; Schubert, H. J. P., psychology; Shaw, Luther, agriculture; Smith, William K., agriculture; Taylor, G. W., zoology; Tharp, W. H., agriculture; Wolfe, J. B., psychology.

For study abroad—Mandelbaum, May, anthropology; Smelser, G. K., zoology; Wald, George, zoology.

THE AMERICAN ACADEMY OF ARTS AND SCIENCES

AT the annual meeting of the American Academy of Arts and Sciences held at Boston on May 11, the following new fellows were elected in the scientific classes:

Class I—Mathematical and Physical Sciences

Clarence Raymond Adams, Brown University.
Albert Arnold Bennett, Brown University.
Glennon Gilboy, Massachusetts Institute of Technology.
Albert Haertlein, Harvard University.
Einar Hille, Princeton University.
Ralph Restieaux Lawrence, Massachusetts Institute of Technology.
Kenneth Lamartine Mark, Simmons College.
Walter Cecil Schumb, Massachusetts Institute of Technology.
David Vernon Widder, Harvard University.

Class II—Natural and Physiological Sciences

Joseph Charles Aub, Harvard Medical School.
Franklin Greene Balch, Boston.
Elliott Carr Cutler, Harvard Medical School.
Frederick Kuhne Morris, Massachusetts Institute of Technology.
David Rapport, Tufts College.
Ralph Hartley Wetmore, Harvard University.

FOREIGN HONORARY MEMBERS

Frederick Orpen Bower, Ripon, England.
Kingo Miyabe, Sapporo, Japan.
Albert Charles Seward, Cambridge, England.

The following officers were reelected:

President, Jeremiah D. M. Ford.
Vice-president (for Class I), Harry M. Goodwin.
Vice-president (for Class II), Walter B. Cannon.
Vice-president (for Class III), Edwin F. Gay.
Vice-president (for Class IV), Charles B. Gulick.
Corresponding Secretary, Tenney L. Davis.
Recording Secretary, Walter E. Clark.
Treasurer, Ingersoll Bowditch.
Librarian, Alfred C. Lane.
Editor, Herbert V. Neal.

PORTRAIT OF PROFESSOR HUBER

DR. G. CARL HUBER, professor of anatomy, director of the anatomical laboratories and dean of the Graduate School of the University of Michigan, was honored in special ceremonies by the students, friends and colleagues, on May 16, when a portrait in oil of himself was presented to the university.

Dr. Frederick G. Novy on behalf of the donors in

presenting the portrait stated in part: "We are gathered here to honor one who has served his alma mater long, faithfully and efficiently. Conspicuous as a teacher and adviser, investigator and administrator, he has won recognition for himself and honor for the university. From the beginning of his career, as I have known from personal contact, Dr. Huber has been guided by the spirit of research, the uncompromising ideal of the investigator. The elaborate studies which he has pursued in his chosen field of histology and embryology have enriched our knowledge and have brought him well deserved recognition among his fellow workers."

Dr. Alexander Grant Ruthven, president, accepted the portrait on behalf of the university. The painting, an excellent likeness of Dr. Huber, is the work of Gari Melchers, the New York artist who was called to Ann Arbor almost twenty years ago to prepare the portrait of Dean V. C. Vaughan.

The event marked the forty-fifth anniversary of the graduation of Dr. Huber from the university and also the forty-fifth year of continuous service as a teacher in the Medical School. The gift was made possible through the contributions of students from each of the medical classes that have studied under Dr. Huber, colleagues and friends.

SCIENTIFIC NOTES AND NEWS

THE Kelvin Medal of the British Institute of Civil Engineers for 1932 was presented to the Marchese Guglielmo Marconi by Lord Rutherford on May 3.

THE University of Cambridge has arranged to confer the honorary degree of LL.D. on Sir William H. Bragg, director of the Royal Institution, London.

DR. E. D. MERRILL, director-in-chief of the New York Botanical Garden, was elected an honorary member of the German Botanical Society at its fiftieth anniversary meeting in Berlin on May 18. The two other American botanists who have received this honor are Dr. Asa Gray and Dr. Roland Thaxter.

ON the occasion of the annual Members' Day of the New York Zoological Society, a white oak tree was planted near the Elephant Walk in honor of Dr. William T. Hornaday, director emeritus of the Zoological Park. It was presented by Hermann W. Merkel, general superintendent of the Westchester Park Commission. Dr. W. Reid Blair, director of the park, accepted the gift. Prior to the garden party, the annual luncheon of the board was held in the administration building. Dr. Charles H. Townsend, director of the New York Aquarium, received a bronze statue of a Townsend fur seal in recognition of his thirty years of service at the aquarium. The bronze was executed by James L. Clark, sculptor-taxidermist of the American Museum of Natural History.

PROFESSOR L. M. DENNIS, head of the department of chemistry, Cornell University, will become professor emeritus at the close of the academic year in June. He became instructor at Cornell in 1887 and head of the department in 1903.

AFTER the retirement of President John Grier Hibben in June, Dr. Luther Pfahler Eisenhart, professor of mathematics and dean of the faculty at Princeton University, will be largely responsible for the internal administration of the university, in accordance with the by-laws which provide that whenever the president of the university is absent the dean of the faculty shall take his place. Edward Dickinson Duffield, president of the Prudential Life Insurance Company and a life trustee of the university, will be acting president.

DR. JAMES EWING has been appointed director of Memorial Hospital for the Treatment of Cancer and Allied Diseases by the Board of Managers, in full charge of all its departments and activities. The appointment will take effect on July 1.

AT the New Orleans meeting the House of Delegates of the American Medical Association elected Dr. Dean Lewis, professor of surgery at the Johns Hopkins University and surgeon-in-chief of the Johns Hopkins Hospital, to the office of president-elect. He succeeds Dr. Edward H. Cary, of Dallas, Texas.

DR. G. CANBY ROBINSON, director of the New York Hospital and Cornell Medical College Association, was elected president of the Association of American Physicians at its recent annual meeting. Dr. James H. Means, Jackson professor of clinical medicine in the Harvard Medical School, was reelected secretary. The next annual session will be held at Washington, D. C.

AT the annual meeting of the American Physiological Society on April 29, Dr. Arno B. Luckhardt, of the University of Chicago, was elected president, and Dr. Frank C. Mann, of the Mayo Foundation, was elected secretary. The next annual session will be held at Cincinnati, probably in April, 1933.

DR. WILLIAM DEB. MACNIDER, Kenan research professor of pharmacology at the University of North Carolina, was elected president of the American Pharmacological Society at the recent annual meeting in Philadelphia.

DR. J. M. HANSELL, formerly senior geologist with the Wisconsin Geological Survey, has accepted a position with the Arkansas Geological Survey as assistant to George C. Branner, state geologist.

DR. WILLIAM B. BRIERLEY has been appointed professor of agricultural botany at the University of Reading, England, in succession to Professor J. Percival who is retiring next September. Since 1918 Dr. Brierley has been head of the department of mycology in the Institute of Plant Pathology at the Rothamsted Experimental Station.

DR. W. D. URRY, at present fellow at the Johns Hopkins University, has been given a research fellowship at the Massachusetts Institute of Technology by an anonymous donor, to enable him to continue his investigations regarding the geological age of minerals through a study of their radioactive and rare gas contents. Dr. Urry will also collaborate with a group of investigators from the Massachusetts Institute of Technology, Harvard University and the U. S. Department of Agriculture in studies of the composition of the atmosphere at high altitudes with reference to chemical composition, occurrence of dust, spores, larva, bacteria and their significance.

THE Committee on Scientific Research of the American Medical Association has given to Dr. Bernhard Steinberg, director of laboratories and department for medical research of Toledo Hospital, Ohio, a grant for the continuation of the experimental work on protection of the peritoneum against infection. The committee had previously given him two other grants for the work on peritonitis.

AMONG Americans who will attend the meeting of the International Congress of Mathematicians to be held in Zurich, are Dr. David Eugene Smith, professor emeritus of mathematics at Teachers College, Columbia University, and Dr. W. A. Hurwitz, professor of mathematics at Cornell University.

DR. ALEŠ HRDLIČKA, of the U. S. National Museum, sailed on May 18 for Kodiak, Alaska, to continue his anthropological work in the Behring Sea region.

DR. WILTON M. KROGMAN, of Western Reserve University Medical School, will be this summer at the head of an anthropological expedition to study Seminole Indians in Oklahoma under the auspices of the Rockefeller Foundation.

THE Carnegie Institution, cooperating with Duke University and the University of Michigan, has sent an expedition to Yucatan to investigate biological problems. The members are A. S. Pearse, ecologist; F. G. Hall, physiologist; Edwin P. Creaser, carcinologist, and William C. Steere, botanist. The party sailed from New Orleans on May 31 for Progreso and will return about September 1. Work will be done at Chichen-Itza, Campeche and Merida.

DR. FREDERICK L. HOFFMAN, consulting statistician, of Wellesley Hills, Massachusetts, expects to sail from Montreal on June 3. He is going abroad chiefly in connection with his cancer research studies with particular reference to the dietary and nutritional aspects.

J. M. STAGG, leader of the British Polar Year Expedition which will spend next winter at Fort Rae in the North West Territory, left Southampton on May 14, in the S. S. *Alaunia*. He was accompanied by A. Stephenson. The remainder of the party, Messrs. W. Morgans, P. A. Sheppard, W. A. Grinsted and J. L. Kennedy, sailed in the *Aurania* a week later.

AT the request of Professor W. L. Bragg, his coming to Cornell University as non-resident lecturer on the George Fisher Baker Foundation has been postponed from next fall until a later date.

PROFESSOR PHILIP A. SHAFFER, of the biochemistry department of Washington University, St. Louis, has been invited to deliver the Herzstein medical lectures at the University of California for 1932.

DR. W. F. G. SWANN, of the Bartol Research Foundation; Dr. Saul Dushman, of the General Electric Company; Professor Debye, of the University of Leipzig, and Professor Charles A. Kraus, of Brown University, are the special lecturers this summer in the department of physics of the University of Illinois.

THE Stephen Walter Ranson lecture at Northwestern University Medical School, given annually under the auspices of the Phi Beta Pi Fraternity, was delivered on May 6 by Dr. Edgar Allen, professor of anatomy and dean of the School of Medicine at the University of Missouri. The title of the lecture was "The Internal Secretions of the Ovaries."

DR. LINUS PAULING, professor of physical chemistry at the California Institute of Technology, gave a John Howard Appleton Lecture at Brown University on May 2. His subject was "The Resonance of Molecules among Several Electronic Structures."

THE Linacre Lecture of the University of Cambridge was given by Dr. J. J. R. Macleod, regius professor of physiology at the University of Aberdeen, on May 6.

THE Halley Lecture of the University of Oxford for 1932 was delivered at the University Museum on May 19, by Professor E. A. Milne, Rouse Ball professor of mathematics and fellow of Wadham College. His subject was "The White Dwarf Stars."

PROFESSOR BASTAI, appointed to a chair of pathology at the University of Florence, recently delivered the inaugural lecture of his course, taking as his subject "Anemia Due to Lack of Hormones."

ON April 26 the District of Columbia Chapter of the Society of Sigma Xi held its annual meeting and dinner. Three newly elected members were presented to the chapter. These were Dr. Charles G. Abbot, secretary of the Smithsonian Institution; Dr. Ray S. Bassler, curator of geology in the U. S. National Museum, and Dr. William A. White, superintendent of the St. Elizabeths Hospital. Each responded with an account of research activities in which he was particularly interested. Dr. Abbot discussed some of the recent advances in the methods of measuring distances and magnitudes of the spiral nebulae. Dr. White presented an account of the developments in the study of the mind. Dr. Bassler described the geological record which he has developed at the National Museum.

DURING May and the first week in June a course of four lectures under the auspices of the California Academy of Sciences on the general subject of "The Beauties of Nature" are being given in the auditorium of the Pacific Gas and Electric Company, San Francisco. The titles and lecturers are: "Our National Park System; What the Federal Government is doing to conserve and make known the Beauties of Nature," by Col. John R. White, superintendent of the Sequoia and General Grant National Parks; "Western American Scenery as exemplified in our National Parks," by Francis P. Farquhar, vice-president of the Sierra Club; "Off the Track in Central America; the History, the Peoples and the Natural Beauties of those Little-known Countries," by John Malcom Nicol, mining engineer and traveller; "Spiritual Values in Appreciation of Nature," by Dr. John C. Merriam, president of the Carnegie Institution of Washington. Each of the first three lectures will be illustrated by stereopticon slides and moving pictures. These are the first of a course to be given annually on "The Beauties of Nature" by the academy, and for which a friend of the academy has provided a permanent endowment of $10,000.

THE *British Medical Journal* reports that it has been decided to form a museum in connection with the Centenary Meeting of the British Medical Association, and the arrangements have been entrusted to the special Museum Committee, constituted as follows: Sir Arthur Keith (chairman); Dr. D. Evan Bedford, Dr. A. B. Bratton, Dr. R. G. Canti, Dr. E. Ffolliott Creed, Dr. Sydney H. Daukes, Dr. J. G. Greenfield, Dr. H. K. Graham-Hodgson, Dr. Donald Hunter, Mr. P. H. Mitchiner, Dr. John O. Oliver, Mr. Thomas G. Stevens, Mr. C. P. G. Wakeley. The honorary secretaries are Mr. Mitchiner and Dr. Oliver. It has been decided to group the museum into the following sections, each under the arrangement of the member named, to whom all communications as to exhibits in the appropriate section should be addressed. Medicine (with diseases of children and orthopedics), Dr. Hunter; Surgery, Mr. Wakeley and Mr. Mitchiner; Obstetrics and Gynecology, Mr. Stevens; Neurology (with mental disorder), Dr. Greenfield; Pathology and Bacteriology, Dr. Bratton; Radiology, Dr. Graham-Hodgson; Tropical Medicine, Dr. Daukes, and Otolaryngology.

THE New York Hospital-Cornell University Medical Center covering three entire blocks along the East River between Sixty-eighth and Seventieth Streets, which has been under construction since the autumn of 1929, will open on September 1. The present New York Hospital, the Lying-in Hospital and the Manhattan Maternity and Dispensary will close their present plants about August 1 to move into the new center. Cornell University Medical College will begin to move at the end of the present school term in June and will open the fall term in the new buildings on September 29. More than half of the 1,000 beds in the hospital will be ready for occupancy at the outset.

CULTURAL institutions in Peiping prepared to welcome in May the Sino-Swedish expedition to central Asia, which returned after five years of exploration and observation in the Kansu, Sinkiang and Mongolia. The expedition left Peiping in 1927 with Dr. Sven Hedin and Dr. Hsu Ping-chang as leaders, and has since been carrying out excavations on a large scale in the Lama territory, in little known parts of the Gobi Desert and in Chinese Turkestan.

THE University of California has accepted the gift of W. H. Kellogg's Arabian horse ranch near Pomona, and a $600,000 endowment, and has agreed to carry on for two-score years the work of the donor. The undertaking is expected to finance research work in animal genetics and at the same time, through surplus of increase, help to stock ranches and stables with a finer breed of saddle horses than the West ever has known.

A GIFT of $32,300 has been made from the Commonwealth Fund, to Columbia University for research into the causes of dental decay.

COLBY COLLEGE has received a gift of more than 200 volumes in the field of geology from George Otis Smith, of the class of 1893, formerly director of the U. S. Geological Survey. They will be known as "The George Otis Smith Collection in Geology" and form a nucleus for a research library in this subject.

A 6,000-acre forest laboratory for forestry research and experimental work has been established by the Forest Service near Westwood, California, in the Lassen National Forest. This experimental forest is the first of the kind to be established in California. It will be under the supervision of the California Forest Experiment Station.

Museum News reports that the Rothschild collection of 280,000–300,000 bird skins from the Tring Museum has been purchased for the American Museum of Natural History, New York The collection covers the field of European and Asiatic bird life. It is expected to fill out the American Museum collection, which already contains about 500,000 specimens. The Rothschild collection includes a large number of type specimens.

THE addition of Wonder Lake and other areas to Mount McKinley National Park has been announced. Mount McKinley Park is the farthest north of the national parks of the United States, and contains the highest mountain on the North American continent. It rises higher from its base than any other mountain in the world, not excluding the Himalayas. The total height of the great peak is 20,300 feet, and on its north and west sides it rises abruptly from a tundra-covered plateau only 2,500 to 3,000 feet above sea-level. Mount McKinley rises 17,000 feet above timberline, and for two thirds of the way down from its summit it is enveloped in snow throughout the year. Closely rivaling scenic Mount McKinley as a spectacle are the great herds of caribou and Dall sheep that roam the park area. Indeed, it was mainly to afford these animals protection that the national park was established in 1917. The inclusion in the park of the Wonder Lake area, lying to the northwest, is important from three main standpoints: From this area may be obtained the most advantageous view of the great mountain obtainable anywhere in the park; the lake shore affords the best location for the establishment of a tourist center within the park, with hotel and other facilities, and its lowlands provide excellent pasture for the park's wild animals, as well as affording them protection from hunters during the winter season when these animals migrate to the lowlands. Good fishing also is available at Wonder Lake, and boat trips can be developed for those not wishing to take the longer, more laborious pack trips. On the east the park boundaries are extended so as to make the west bank of the Nenana River, for all practical purposes, a natural boundary line for the park. The total area of the park with the recent additions is 1,939,493 acres.

DISCUSSION

THE POSSIBLE CHEMOTACTIC EFFECT OF THE SALIVARY SECRETIONS OF CERTAIN INSECTS UPON MICROFILARIAE

IN his valuable report upon *Onchocerca* investigations in Guatemala,[1] Strong states that three species of a Eusimulium fly are concerned in the transmission of *Onchocerca caecutiens* and that if one of these flies "is allowed to bite on the face of an infected individual, there are found on examination of the blood in the abdomen many more microfilariae than are encountered in the direct examination of the skin, but, in a case where a previous examination of a section of the skin of the face has shown no microfilariae, if a second section is made through or very near the spot where a fly has just bitten, very large numbers of microfilariae (over one hundred) may be found in it. Very clearly the fly usually produces in some way during feeding a concentration of the microfilariae about the point of the bite, many of which it imbibes." Strong then calls attention to the usefulness of this phenomenon in diagnoses where the microfilariae are present only in very small numbers.

A similar phenomenon was observed by Ashburn and myself during our investigations of the development of the microfilariae of *Filaria philippinensis* in the Philippines during 1907 and reported in the *Philippine Journal of Science,* Volume 11, No. 1, of that year. This microfilaria, which we regarded to be a new species, but which is now generally considered to be identical with the microfilaria of *Wuchereria bancrofti,* possesses no periodicity and usually occurs in the blood in very small numbers. In investigating the development of this microfilaria in the mosquito, *Culex quinquefasciatus,* we noted that blood ingested by the mosquito contained many more microfilariae than we could find in approximately the same amount of blood obtained from the patient. Regarding this we stated:

> One of the earliest observations to be made in studying infected mosquitoes is one relating to the number of filariae ingested. In some manner, concerning which it is possible to construct interesting hypotheses, the mosquito manages to get from the body of the patient 40 to 50 or more times as many filariae as it is possible

[1] *New England Journal of Medicine,* Vol. 204, p. 916, 1931.

for us to obtain in a similar amount of blood from a needle prick. Thus, in good thick smears under 22 millimeter (⅞-inch) cover glasses, we will usually find but one or two, and oftentimes no filariae. In the blood from the stomach of a mosquito which has recently bitten, the amount of blood usually appears to be less than in these thick cover-slip preparations, but it is nearly always possible to find from 40 to 80 filariae, and it has occurred to us that this fact might have a practical value in examining cases of suspected filariasis in which the parasites are so few in number as readily to be missed. It might be of use in revealing embryos in the blood of cases of elephantiasis, where the filariae, though believed to be present, are seldom found. We have not had an opportunity to put our suggestion into practice except on our last four cases of known filariasis, in all of which the result has been as stated.

So far as is known, this observation regarding the phenomenon described has not been confirmed by other workers, but it would appear to merit further study, both from the standpoint of scientific interest and practical diagnostic importance. In view of the fact that the same phenomenon occurs in *Onchocerca* infections, it is probable that it also occurs in other conditions in which parasites are transmitted by blood-sucking insects.

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AINU PITS IN THE KURILE ISLANDS

In the summer of 1931 I had an opportunity to visit the largest of the Kurile Islands, Etorofu. Arriving there on August 3 at a small village called Rubetsu, our party proceeded to cross the island on foot, collecting on the way. That evening at dusk we came to the Pacific Ocean and chanced upon some Ainu pits. At that time we only found a few broken pieces of pottery.

The next day, while hunting for new specimens of spiders, a slight exposure of shell near one of the Ainu pits was found. Upon investigation at a near-by village of Toshimoe, we found that these mounds had never been opened.

After digging in these mounds for two days we found a large quantity of pottery—mostly broken pieces and one complete vase with a good bear design. Several bone tools were also found, one a U-shaped instrument made from whalebone, the use of which has not been determined. As far as known this is a new find and not recorded from any other mound in Japan. The shells were found under twelve to eighteen inches of soil. The heap was to the north of the pits and had probably been thrown there from the doorways of the huts.

The age of the finds is an extremely difficult matter to determine. All evidence points to a stone age period, but as the Ainu, in isolated places, continued to use stone after contact with the Japanese their age can not be determined. A safe estimate would place the date at no more than five hundred years ago. The pottery designs are typical of the Ainu art, though less ornate than those found at other places in Hokkaido and the Kuriles. On the eastern coast of Etorofu at Wannippu there are many Ainu pits, and in a trip of less than five miles over forty pits were counted.

The larger part of this material is now in the Hokkaido Imperial University at Sapporo, where other valuable finds have been placed. A detailed study with drawings of it will be made this coming year.

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THE JESUIT FOURTH VOW

IN view of the statement of Dr. José F. Nonidez in SCIENCE for May 6, pp. 488–489, it will be of interest to the readers of this journal to know the precise wording of the fourth vow taken by some of the members of the Society of Jesus (the Jesuits). The Latin text is: "Insuper, promitto specialem obedientiam Summo Pontifici circa missiones, prout in iisdem litteris Apostolicis et Constitutionibus continetur." (Constitutiones Societatis Jesu, Pars V, Caput III, 3; 1869 Ed., I, 78). Translated this is: "Besides, I promise special obedience to the Supreme Pontiff in regard to the missions, according to the content of the same Apostolic Letters and Constitutions (*i.e.*, Papal Letters of Approbation and Constitutions of the Society of Jesus)." It is obvious that this vow is implicitly contained in the third of the immediately preceding three religious vows which Dr. Nonidez rightly says are unobjectionable, and that it only stresses a point of religious obedience, the substance of which is common to all religious orders that engage in missionary activities. It is of purely spiritual import, and does nothing more than express a readiness to go anywhere in the world on missionary duty if the Pope should so command.

JAMES B. MACELWANE, S.J.

INDEXES OF BIOLOGICAL ABSTRACTS

THE Board of Trustees of *Biological Abstracts* is now in position to assure readers of *Biological Abstracts* that the editorial and publication difficulties that have stood in the way of prompter issuance of the indexes have been overcome, through a grant for

the purpose by the Rockefeller Foundation. The index of Volume 2 will be mailed in the fall, and the others will follow as rapidly as the necessary editorial work can be accomplished. With the indexes of the earlier volumes completed, each subsequent index should be available reasonably promptly after completion of the corresponding volume. Specific announcements will be made from time to time in current numbers of *Biological Abstracts*.

C. E. McCLUNG,
President, Board of Trustees,
Biological Abstracts

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE USE OF COLOR FILTERS IN COLORIMETRIC ANALYSIS

IT is a common difficulty in colorimetric work to encounter conditions in which a color match between a solution of an unknown and one of a pure substance is very imperfect. Although in recent years more and more use has been made of limiting the portion of the visible spectrum used for this work, it is probable that not enough workers realize the advantages to be gained by such limitations or the ease of their application. Among recent methods utilizing selected portions of the spectrum can be mentioned those described in the articles of Kennedy, Flesche and McClendon, Gregory and Pascoe, Folin and Malmros, Cavett and Armstrong.

Kennedy[1] made a careful spectrophotometric study of blood solutions, and on the basis of the study advocated the use of a light filter for the determination of hemoglobin as carbonyl hemoglobin, using a "neutral grey" filter as a standard. Flesche and McClendon[2] used the same light filter, but employed the Newcomer glass as a standard.

Gregory and Pascoe[3] made a careful spectrophotometric study of the color produced by the reaction of bile salts with furfural in sulfuric acid of a definite concentration, and determined the most marked absorption band of the resulting product. They then obtained light of the same wave-length as that absorbed in this band by means of a neon lamp and appropriate color filters.

The above methods employing light approximating monochromatic represent undoubtedly the best method for obtaining a color match between two colored solutions, since no other substance with absorption in other regions can have any effect on the color match obtainable. However, a spectrophotometric analysis of the colors produced by a given reaction requires special equipment not available to all research workers, and certainly not available to many clinical laboratories. As will be shown, excellent results can be frequently obtained without the use of a laborious technique.

Bausch and Lomb was unable to produce a glass that would give the same spectrum as does acid hematin. A divergence of the curves given by the glass and by the solution was encountered in the longer wave-lengths. A good match was obtained by blocking out the longer lengths with a blue glass filter. Armstrong[4] found that use of this same blue glass allowed a good match of colors in his method for the determination of fluorine. In these cases, while careful studies were made of the absorption spectra involved, it was not found necessary to use monochromatic light, the mere shutting out of one end of the spectrum being sufficient restriction.

Folin and Malmros[5] were troubled by contamination of the blue color of colloidal ferric ferrocyanide by varying amounts of potassium ferricyanide. The latter substance absorbs rays at the short end of the spectrum, while the Prussian blue absorbs the longer rays. The authors mentioned found by trial that they obtained a close match of the two fields when the amount of light of short wave-length was cut out or decreased by transmission through yellow paper. In this laboratory, when their method is used it is found more convenient to block out violet and blue rays by passage of the light through a jar of potassium ferricyanide solution or of picric acid solution.

Recently workers in this laboratory have adopted the following simple procedure when difficulty is encountered in securing a color match between an unknown mixture, as blood or urine, and a standard pure solution. Results have been excellent. Cavett[6] employed this method, finding that a color filter gave a much better match between standard and unknown in Hanke and Koessler's analysis for histidine. Other workers are now using filters in procedures to be described in future papers.

Carry out the color reaction with a fairly strong pure solution on the substance for which analysis is to be made. Pour the resulting solution in a flat-

[1] R. P. Kennedy, *Am. J. Physiol.*, 78: 56, 1926; *ibid.*, 79: 346, 1927.

[2] B. A. Flesche and J. F. McClendon, *Soc. Exp. Biol. Med.* 25: 791, 1929.

[3] R. L. Gregory and T. A. Pascoe, *J. Biol. Chem.*, 83: 35, 1929.

[4] W. D. Armstrong, *Soc. Exp. Biol. Med.*, 29: 414, 1932.

[5] O. Folin and H. Malmros, *J. Biol. Chem.*, 83: 115, 1929.

[6] J. W. Cavett, *J. Biol. Chem.*, 95: 335, 1932.

sided vessel, and examine its absorption spectrum by means of a simple hand spectroscope, using the same light source later to be used for the colorimeter. Dilute the solution, and inspect again. Note the region of the spectrum in which the maximum change of absorption occurs. Next examine, with the same light source, several light filters or solutions of various chemicals, until one is found which transmits light in the region of absorption by the above solution, but which absorbs as completely as possible all other light. Superimposition of the filter and the strong standard solution should shut out practically all visible rays. If the color filter finally adopted is of glass or other solid material, it can be placed over the eyepiece of the colorimeter, cut to fit inside the ocular tube of the colorimeter, or placed over the source of light. If the color filter is a solution, it can be placed in a flat-sided glass jar, as a museum jar, which is then placed in front of the colorimeter, or can be placed in accessory cups, of equal depth, one of which is placed under each colorimeter cup. A colored light source, as a neon lamp, may be used.

Where it is desired to block out the long end of the spectrum, a Bausch and Lomb blue hemoglobin filter can be used. An aqueous solution of picric acid blocks out the short end. These two superimposed allow practically no light to pass, except two faint bands in the green and in the yellow, respectively. A potassium chromate solution acts similarly to a picric acid solution. A solution of nickel sulphate blocks out both ends of the spectrum, and transmits the middle portion. If desired, a set of glass or gelatin filters may be purchased from an optical supply house, and will be found quite convenient. In many instances, however, they will be found not at all superior to the above-mentioned improvised filters, and ones similar to them, available in any laboratory.

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SPECIAL ARTICLES

PROBABILITY OF THE PRESENCE OF A SEX ANTAGONISTIC SUBSTANCE IN URINE

IT has been frequently observed in this laboratory that certain extracts of normal, as well as of pathological urines, when injected into immature animals, inhibit the development of sexual organs. The results first obtained were not very uniform, as the treatment was never extended beyond a week. By extending the injections longer we obtained in a series of experiments typical sex organ inhibition. One of such experiments of 32 days' duration will be described here in detail.

Six male and six female rats of about the same initial weight were placed on an artificial food mixture consisting of casein, starch and salts with the daily addition of 0.5 gm dried yeast, 2 drops of cod-liver oil, 1 gm of dried milk and 400 mg of lard. The animals were divided into three groups, controls and two groups receiving daily subcutaneous injections of two different urine extracts, representing 250 cc of urine daily. The extracts were prepared in the following way.

Mixed male and female urines[1] (non-acidified) were extracted for 48 hours in a continuous extractor with ether. The ethereal extracts were evaporated and the residue extracted with as many cc of water, that one cc of extract represented one liter of the original urine used. The second extract was prepared from the water-insoluble material, by dissolving the residue in a corresponding amount of peanut oil. The two extracts, prepared fresh every few days, showed the following general characteristics. The aqueous extracts were of a brown-yellow color and deposited on standing a brown oxidation pigment. They contained probably small amounts of the cortical suprarenal hormone and traces of female hormones. The oil-soluble extracts, on the other hand, contained no detectable amounts of andronin (male sex hormone), but relatively large amounts of theelin-like substances, which were, however, mostly insoluble in alkali. The animals were weighed every 4 days and the food intake determined every second day. The food intake was fair in all experimental groups and the growth of females was comparable in all the groups. These facts would practically eliminate the probability of toxic effects of the injections. After 32 injections the animals were sacrificed and the weight of testicles and seminal vesicles in the males, and of ovaries and uteri in females was determined in absolute figures, as well as per gm of body weight. The table below summarizes the experiment, the figures representing the average of two animals.

As contrasted with short experiments which show sometimes stimulation and sometimes inhibition of development of sex organs in males and a constant stimulation in females, the described typical experiment of longer duration leaves the males in the infantile stage, while a marked retardation is noticed in females. The difference in the degree of influence in the 2 sexes is tentatively explained by the compen-

[1] Our thanks are due to the authorities and the head nurse of Hôpital Stell, Fondation Edward Tuck, in Rueil-Malmaison for supplying us with urines of patients for our investigations.

MALES

Rats number	Weight Initial	Weight Final	Per cent. incr.	Food int.	Per gm body wt.	Gonads in mg.	Per gm body wt.	Sem. ves. in mg.	Per gm. body wt.	
406, 407	49.5	153.5	210	584	2.8	*4622.3*	*15.0*	*534.9*	*1.7*	Controls
410, 411	53.5	172.5	222	626	2.6	*4789.1*	*13.8*	*822.9*	*2.4*	Aq. extr.
414, 415	49.5	109.5	121	467	3.9	*976.5*	*4.4*	*44.3*	*0.2*	Oil-sol. extr.

FEMALES

Rats number	Weight Initial	Weight Final	Per cent. incr.	Food int.	Per gm body wt.	Ovaries in mg.	Per gm. body wt.	Uteri in mg.	Per gm body wt.	
408, 409	50.0	125	150	575	3.8	*184.7*	*0.73*	*635.3*	*2.5*	Controls
412, 413	48.5	119	145	531	3.8	*232.3*	*0.97*	*623.0*	*2.6*	Aq. extr.
416, 417	47.0	115.5	145	484	3.5	*125.1*	*0.54*	*307.9*	*1.3*	Oil-sol. extr.

satory effect of theelin-like substances present in relatively large amounts in the oil-soluble extracts.

The sex-inhibiting substance was found roughly in the same fraction which contains the male hormone and is present in normal urine. Control experiments of long duration injecting male and female hormones to their respective sexes, as well as treating male animals with female hormone and *vice versa* did not show any appreciable inhibitive effect on sex organs. Some of the inhibitive action of sex hormones, described in the literature, might be due to the presence in them of the substance described in this paper.

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BERRIES RICH IN CALCIUM

HACKBERRIES[1] (*Celtis occidentalis* L.—Urticaceae) have long been used as food by various tribes of North American Indians. The Dakotas[2] pounded the fruit (including pits) and used them as a flavor for meat. The Pawnees pounded the fruit and mixed them with fat and parched corn. The Meskwaki Indians[3] ground the fruit and made them into mush. Hackberries have a sweet pleasant taste with a flavor somewhat resembling that of figs.

The ripe fruit which was used in our investigation was collected during 1930 and 1931 in Nebraska and Kansas. Analysis of the fruit (pulp and pits were ground together) gave the following results (all figures refer to moisture-free fruit); reducing sugar (invert sugar) ranged from 32 to 36 per cent.; non-reducing sugars were absent; pentosans and hemicelluloses, 2–4 per cent.; crude fat (ether extract), 2.8 per cent.; crude protein, (N x 6.25), 11.6 per cent. While it is the usual practice to report separately the analyses of the edible portion of the fruit and the pit, in this article the analysis of the entire fruit is reported, first, because the Indians used the entire fruit, and secondly, because on account of the large pits and small pulpy part this is the only way to use the fruit economically.

The most interesting feature of this fruit is its mineral content. Analysis of several samples gave an average value of 29 per cent. ash, almost half of which (48 per cent.) was CaO, or 13.9 per cent. CaO in the moisture-free fruit. Evidence adduced below indicates strongly that the calcium is present in the fruit as calcium carbonate. In that case, 13.9 per cent. of CaO would correspond to 24.9 per cent.

[1] Although popularly known as berries, hackberries are botanically drupes.

[2] Gilmore, *33rd Ann. Rep.* Bureau Amer. Ethnol., p. 76, 1919.

[3] Smith, *Bull. Publ. Museum*, Milwaukee, p. 265, 1928.

$CaCO_3$, *i.e.*, calcium carbonate constitutes about one-quarter of the weight of the dry fruit. There were also present 1.2 per cent. of oxides of iron and aluminum, and 2.4 per cent. silica. The moisture content of the fruit as received ranged from 15 to 19 per cent.

Payen,[4] in 1854, analyzed the pits of the hackberry and proved that the calcium is present as carbonate by placing the ground, dried pits in dilute hydrochloric acid and weighing the carbon dioxide given off. The results of his analysis are as follows:

Organic matter	28.7 per cent.
Calcium carbonate	64.2 per cent.
Calcium phosphate	trace
Silica	7.0 per cent.

While it is apparent that most of the calcium in the fruit is present in the pit as carbonate, the possibility of the presence of other calcium salts must not be overlooked. In order to investigate this possibility 4.1 kilos of ground hackberries were extracted twice with boiling water. The dried presscake (1.7 kilos) contained 28.7 per cent. CaO and 54.7 per cent. ash. Direct determination showed that 23.6 per cent. of CO_2 was given off on addition of mineral acid to the ground fruit, thus confirming Payen's results and showing that the ash of the extracted material is mostly calcium carbonate. There were also 3.9 per cent silica, and 0.3 per cent MgO in the ash.

The water solution was extracted with ether and on evaporating the ether 16.5 gms of a yellow fatty oil, probably kernel oil, remained. The solution was then precipitated with alcohol. The resulting gummy precipitate weighed 45 gms and contained 10.1 per cent CaO (total ash 23.2 per cent.).

The aqueous-alcoholic solution was precipitated with lead subacetate, and the recovered acids were converted into ethyl esters (62.8 gms) and fractionated. The different fractions were identified by means of the hydrazides. Fraction 1 (0.7 gm) yielded oxalic hydrazide (m.p. 235°). The hydrazide of fraction 2 (1.6 gm) was identified as that of malic acid (m.p. 179°). Fractions 4–8 (23 gms) yielded citric trihydrazide (m.p. 106°). Fraction 9 produced an oily hydrazide. The acid of this fraction is an unsaturated acid which, on oxidation with cold 5 per cent. $KMnO_4$, yields succinic acid and an oily acid.

The conclusion therefore must be drawn that, although most of the calcium in hackberries is in the form of carbonate, there are also calcium salts of malic, citric and oxalic acids, and of some gummy acids, and an unsaturated acid of unknown constitution.

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THE NATIONAL ACADEMY OF SCIENCES. II

A recessive zygotic lethal resulting in 2:1 ratios for normal vs. male-sterile and colored vs. colorless pericarp in F_2 of certain maize hybrids: R. A. EMERSON. Maize hybrids between types with red and others with colorless ears normally have colored ears in the first generation, F_1, and exhibit in the second generation, F_2, the typical mendelian ratio of three colored to one colorless, with one third of the colored individuals breeding true in the next generation, F_3. A Peruvian maize with red mosaic ears, when crossed with local inbred strains having colorless ears, gave a 2:1 ratio in F_2 and later generations involving over 1,100 plants. Moreover, the ratio of true breeding to segregating individuals among the colored ears was 1:87, instead of 1:2 as expected. Evidently the 2:1 relation in F_2 is due to the almost complete elimination of the true breeding colored individuals. One of the inbred colorless strains used in crossing with the Peruvian maize was male-sterile, *i.e.*, it produced no good pollen. F_1 was normal, but in F_2 and later generations the normals were to the male-steriles as 2:1, just as with ear color. Of the normals, only one in 37 was colorless and of the male-steriles, only one in 46 was colored. Obviously, this male-sterility is closely linked with ear color, so that whatever distorts the normal ratio of colored to colorless affects similarly the ratio of normal to male-sterile. If there be assumed a genetic factor, closely linked with the factor for colored ears, which prevents the development of the kernels which receive it from both the egg and pollen, the results obtained are readily accounted for. This hypothesis is rendered the more plausible by the fact that self-pollinated colored ears are not well filled with kernels.

The chromosomes of haploid maize, with special reference to the double nature of the univalent chromosomes in the early meiotic prophase: L. F. RANDOLPH (introduced by R. A. Emerson). Certain characteristics of the chromosomes in the root-tip cells and in the microsporocytes of haploid individuals are described and illustrated. The presence of 10 chromosomes in each cell instead of the 20 present in normal diploids facilitated the study of individual differences between the members of the group in the somatic cells, and their existence as univalents rather than as bivalents in the meiotic prophase simplified the interpretation of the double condition of the chromosomes in this stage. At the time of the differentiation of the leptotene threads in the very early

[4] *Compt. Rend.*, 38, 241, 1854. Payen's *Celtis cordata* is synonymous with *C. occidentalis.*

prophase the chromosomes were clearly double. The evidence for an interpretation of this doubleness as a longitudinal division of the univalent chromosome is presented. The significance of this observation is discussed in relation to its direct bearing on certain current theories of synapsis and crossing-over, which are based on the assumption that synapsis precedes the longitudinal division of the chromosomes. Non-correspondence of chromomeres in corresponding regions of sister chromatids was observed frequently throughout the early prophase stages. This suggests that in maize these structures have little or no morphological significance.

Effects of monochromatic radiation in the visible and ultra-violet on the virus of typical tobacco mosaic: B. M. DUGGAR and ALEXANDER HOLLAENDER. The virus of typical tobacco mosaic, approximately purified, was exposed in solution of v/100 to monochromatic light at approximately 0° C. The virus dilution was made up, after pasteurization, in physiological salt solution in which was diffused *Bacillus prodigiosus* for purposes of comparison. The bacteria were at a concentration approximately 300,000 cells per cc. Exposure was made in a quartz cell provided with a quartz stirrer. The energy thrown in was measured by the usual thermopile-galvanometer procedure. Likewise, the energy absorbed by the solution was measured except in a few cases. Exposures for various intervals were made at suitable lines in the mercury spectrum from 6150 Å as the longest wavelength to 2537 Å as the shortest. Twelve spectral lines were employed, and with another monochromator and a spark source of radiation 2144 and 2315 Å were used. From the exposed solutions inoculation of tobacco plants were made at suitable dilutions. At the same time dilution cultures were made for bacterial counts, thus furnishing quantitative biological criteria. Tables and curves have been prepared, showing the lethal effects for both virus and bacteria. The results indicate that far greater intensities are required to inactivate the virus than to kill the cells of bacteria under precisely the same conditions. In general, within the range of time periods which are practicable, the inactivation of virus is limited to wave-lengths shorter than 3350 Å. A direct method of leaf radiation has been devised for work at different temperatures.

On the stability of physiological characters of bacteria: E. B. FRED. Variations which are more or less permanent changes in cultures are conceivably of two types—those concerned in possible life-cycles or dissociative changes in the bacteria and those of a deteriorative nature, resulting from prolonged exposure to the so-called "artificial" conditions of the laboratory culture. It is the purpose of the present paper to consider the latter type, citing cases of observations on certain biochemical characters of cultures freshly isolated and of the same cultures after some years of existence in the laboratory. Any tendency toward uniformity of cultures may be forgotten in the flood of publications which have focused attention on the problem of bacterial variation. Striking examples of such stability, covering the activities of a wide variety of bacteria, spore-forming and non-spore-forming, motile and non-motile, aerobic and anaerobic, were cited. No attempt was made to deal with bacterial dissociation or life cycles, but rather to present certain observed facts which relate to the stability of different groups of bacteria when kept for years under suitable artificial conditions. To the author it appears that the claims of gradual deterioration are not always supported by facts. The results of this study, therefore, support the fundamental concept of the stability of pure cultures of bacteria under suitable artificial conditions.

Henry as a physicist: W. F. MAGIE.

Henry as an electrical pioneer: BANCROFT GHERARDI.

Henry as an administrator: CHARLES GREELEY ABBOT.

Cosmic-ray energies and their bearing on the photon and neutron hypotheses: ROBERT A. MILLIKAN and CARL D. ANDERSON.

Distances and luminosities of four thousand of the brighter stars: WALTER S. ADAMS. The spectroscopic method of determining the distances of stars is based upon the fact that among stars of the same spectral type, that is, the same surface temperature, many of the spectral lines show differences in intensity which are correlated with the luminosity of the stars. Highly luminous stars with temperatures equal to or lower than that of the sun are of great size and have low densities, a condition which favors ionization in their atmospheres. Hence the lines due to the ionized atom are prominent in giant stars whereas the lines of the neutral atom, especially for elements of low ionization potential, are marked in the less luminous or dwarf stars. Stars of known luminosity are used to establish quantitative correlation curves between the intensities of selected spectral lines and the intrinsic brightness. The method, which was discovered at the Mount Wilson Observatory, has been applied to about 4,000 stars with temperatures ranging from over 10,000° C. to 3,000° C. The chief results of the study are: first, the striking evidence of the separation of stars with temperatures less than that of the sun into distinct classes of giants and dwarfs with no stars of intermediate luminosity; second, the merging of these classes among stars of the higher temperatures; and third, the remarkable tendency of both giant and dwarf stars of lower temperatures, but especially the giants, to fall within definite narrow limits of luminosity. An immense majority of such stars have almost exactly the same candle-power.

Nebulous objects in Messier 31 provisionally identified as globular clusters: EDWIN HUBBLE. One hundred and forty objects have been found in or close to the borders of Messier 31, the Andromeda nebula which, from their numbers, their distribution and the radial velocity of a typical example, are presumably to be associated with the spiral. From their forms, structure, colors, luminosities and dimensions, they are provisionally identified as

globular clusters. Absolute photographic magnitudes range from −4 to −7 with maxima at −5.0 and −6.2. Diameters range from 4 to 16 parsecs. Galactic globular clusters, according to Shapley's data, are systematically brighter than the objects in M 31 by amounts varying from 0.75 to 1.95 mag., depending on the interpretation of the data. Known clusters in the Magellanic Clouds are comparable with the brighter objects in M 31. Objects apparently similar to those in M 31 are found in NGC 6822, M 33, M 81 and M 101.

The determination of the orbit of an object moving under the attraction of the sun and of the combined mass of earth and moon: A. O. LEUSCHNER and E. C. BOWER. As a measure of preparedness in case of the discovery of an object so close to the earth that the usual methods of orbit determinations do not apply, a solution is proposed, based on the equations of motion for three bodies, which in the first approximation determines whether the object is a planet or a satellite to the earth. A satellite would be revealed graphically through the intersection of a straight line with a bump in a curve, due to parallaxic terms arising from the difference of direction of the object as seen from the observer and the center of the mass of the earth-moon system. The process was illustrated by application to the recently discovered fast-moving Delporte object. The earlier observations of this object indicated the possibilities of its nature. It could be either a planet moving in a cometary orbit similar to that of Eros and passing through perihelion about the time of discovery near the earth. In that case its distance from the sun would be nearly the same as the distance of the earth from the sun. Or the object might be a new but tiny satellite to the earth, giving us a second moon. In fact in that case its distance from the earth would have been about 1.5 times the distance of the moon and its period of revolution about five months. Application of the new method of solution readily revealed that the latter possibility is definitely excluded and that the object is a planet moving in a cometary orbit. It may have been observed years ago as a comet. Its importance lies in the fact that it can approach closer to the earth than Eros and therefore furnishes the best opportunity for more accurate determination of the distance of the sun from the earth.

Trial of a projection method for measuring astronomical photographs: FRANK SCHLESINGER and ARTHUR L. BENNETT. In this method of measuring, a strong light is placed behind the photographic plate and is kept in the line of collimation of the measuring microscope. The images of the plate and of the cross wires are then thrown upon a white mat surface with a magnification of about thirty. The microscope being moved with reference to the plate by means of a long and accurate micronometer screw, the settings are made by superimposing the image of the cross wires upon the star images. A large number of plates were measured in this way and also by the usual method; the two results are equally accurate, or if there is any difference it is in favor of the projection method. The new method has the advantages of being a little more rapid and far less tiring.

Curvature theorems in dynamics (illustrated): EDWARD KASNER.

A deaf speaker: FREDERICK BEDELL (introduced by Ernest Merritt). The microphone, phonograph and radio, and the loud speaker which they operate have reached a high stage of development for the entertainment and education of people with normal hearing, and the benefits of this development have been far-reaching. There are, however, in this country some fifteen million people who on account of defects in hearing are completely debarred, or to a large extent debarred, from enjoying these benefits. The need, therefore, is evident for a "deaf" speaker which will give audition to the deaf similar to the audition given by a "loud" speaker to those who have normal hearing. Such a speaker for the deaf, utilizing bone conduction from a vibrating applicator applied to the teeth or bony structure of the head, has been developed. Sound vibrations are thus detoured around the middle ear, where defects causing deafness are usually located, and are picked up by the bone-encased fluid of the inner ear. Special attention has been paid to matching mechanical impedance, so that the vibrations are given proper force and amplitude for transmission through the bone, and to controlling frequency response so as to give best audition for different types of deafness. In this way people who have not heard for years have been able to hear.

On the theory of ferromagnetism: PAUL S. EPSTEIN. According to Heisenberg the ferromagnetic phenomena are due to the magnetic spin moments of the valency electrons. In spite of some work done by Bloch and others, the theory was not sufficiently carried through mathematically, so that there remained doubts whether the spin moments are a sufficient cause of ferromagnetism. The author succeeded in finding expressions for the probability of a given magnetic moment of a crystal which are rigorous within the simplifying assumptions of the theory. They permit to set up the criteria for a substance becoming ferromagnetic and to say positively that, under certain conditions, the spin moments can produce ferromagnetism.

(*To be concluded*)

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